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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/986,487	11/09/2001	Tatsuo Fujisaki	839.450	5285
5514	7590	03/02/2004	EXAMINER	
FITZPATRICK CELLA HARPER & SCINTO 30 ROCKEFELLER PLAZA NEW YORK, NY 10112			MUTSCHLER, BRIAN L	
			ART UNIT	PAPER NUMBER
			1753	

DATE MAILED: 03/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/986,487	FUJISAKI ET AL. <i>EB</i>
	Examiner	Art Unit
	Brian L. Mutschler	1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 14 January 2004.  
 2a) This action is FINAL.                            2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-3 and 5-8 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-3 and 5-7 is/are rejected.  
 7) Claim(s) 8 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date \_\_\_\_\_

5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_

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## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 14, 2004, has been entered.

### ***Claim Objections***

2. Claim 8 is objected to because of the following informalities:

- a. In claim 8 at line 2, please insert --system-- after "generation".
- b. In claim 8 at line 3, it is suggested that the phrase "detecting an output" be changed to --detecting an electric energy output--. This suggestion clarifies the use of the term "output" consistent with the meaning provided in the disclosure on pages 14 at lines 23-25 and page 20 at lines 4-8, which defines the output as an output power or output current.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3 and 5-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Johnson (U.S. Pat. No. 6,080,927).

Regarding claim 1, Johnson discloses a solar power generation system having solar cells mounted on solar cell panels (**1401, 1402, 1403**) and is provided with an inlet pipe **1404** and an outlet pipe **1405** for a cooling/heat removal fluid (col. 11, lines 1-3). The system is controlled by a microprocessor, which controls the tracking and regulatory processes of the system including the sun tracking of the heliostats, the flow monitoring of the heat removal fluid and the solar cell surface temperature, which acts as a primary control of the flow rate (col. 12, line 44 to col. 13, line 32). The microprocessor uses a control algorithm, which is capable of controlling multiple device features (col. 12, line 44 to col. 13, line 16). The use of such a control algorithm requires at least some form of memory to store and perform the procedures necessary for the algorithm to function. The system disclosed by Johnson controls the flow of the fluid, and consequently the cooling, by the flow monitoring means and the solar cell surface temperature monitor, which controls the fluid flow rate based on the temperature of the solar cells (col. 12, lines 58-67). The control system comprises a microprocessor, which inherently comprises a clocking function, and also memory means, which are used to track the sun (col. 12, lines 48-52).

Regarding claim 2, Johnson also discloses that a demand monitor may be used, which steers the array away from the sun when little power is being drawn, i.e., it

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senses the usage of the power output of the array (col. 12, lines 64-67). By turning the array away from the sun, the temperature of the solar cells would also be reduced due to the diminished incident radiation. This output-based control allows the system to operate at an optimum driving state.

Regarding claim 3, Johnson discloses a solar power generation system using a cooling system comprising a cooling/heat removal fluid (col. 11, lines 1-3).

Regarding claims 5 and 6, Johnson provides a microprocessor that supervises the disposal of surplus energy by charging batteries or converting the energy into a.c. power (col. 13, lines 17-32). In order to perform the functions, the microprocessor must be able to detect and monitor the output of the solar cells.

Regarding claim 7, the power generating system is mounted on heliostats (**1001**, **1002**) that track the movement of the sun (col. 11, lines 41-44).

Regarding the limitations "wherein said memory-and-operation means comprising... previously determined standard temperature values" in lines 6-7 of claim 1, and "wherein said cooling means is driven in accordance with said standard temperature value" in lines 9-10 of claim 1, the limitations do not positively limit the structure of the claimed device. Standard temperature values are not physical features, but are pieces of information or data stored in a memory device. Furthermore, the limitation "wherein said cooling means is driven in accordance with said standard temperature value" is a method of using the device and does not further limit the structure of the device other than to require the ability to store such values. The device of Johnson uses a microprocessor control system having a control algorithm to manage

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and control the various systems of the device. In order to perform the control procedures using a control algorithm, the control system must have some form of memory to store and execute the procedures that constitute the control algorithm. Combined with the flow monitoring means and surface temperature monitor, such a control system would be capable of performing in the same manner as the claimed use of the instant claims.

Since Johnson teaches the limitations recited in instant claims, the reference is deemed to be anticipatory.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3 and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (U.S. Pat. No. 6,080,927) in view of Mimura et al. (U.S. Pat. No. 6,147,295) or in view of Guha et al. (U.S. Pat. No. 4,555,586).

(Note: the following rejection of claims 1-3 and 5-7 is based upon an alternative mode of operation, wherein the operation of the cooling means is driven by the power output or current output, which is a function of the amount of light incident on the solar cell, in the same way the temperature of the solar cell is also dependent upon the amount of incident radiation.)

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Regarding claim 1, Johnson discloses a solar power generation system having solar cells mounted on solar cell panels (1401, 1402, 1403) and is provided with an inlet pipe 1404 and an outlet pipe 1405 for a cooling/heat removal fluid (col. 11, lines 1-3). The system is controlled by a microprocessor, which controls the tracking and regulatory processes of the system including the sun tracking of the heliostats, the flow monitoring of the heat removal fluid and the solar cell surface temperature, which acts as a primary control of the flow rate (col. 12, line 44 to col. 13, line 32). The microprocessor uses a control algorithm, which is capable of controlling multiple device features (col. 12, line 44 to col. 13, line 16). The use of such a control algorithm requires at least some form of memory to store and perform the procedures necessary for the algorithm to function. The system disclosed by Johnson controls the flow of the fluid by the flow monitoring means and the solar cell surface temperature monitor, which controls the fluid flow rate based on the temperature of the solar cells (col. 12, lines 58-67). The control system comprises a microprocessor, which inherently comprises a clocking function, and also, "the device may be installed with a clock/calendar" to track the sun (col. 12, lines 48-52).

Regarding claim 3, Johnson discloses a solar power generation system using a cooling system comprising a cooling/heat removal fluid (col. 11, lines 1-3).

Regarding claims 5 and 6, Johnson provides a microprocessor that supervises the disposal of surplus energy by charging batteries or converting the energy into a.c. power (col. 13, lines 17-32). In order to perform the functions, the microprocessor must be able to detect and monitor the output of the solar cells.

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Regarding claim 7, the power generating system is mounted on heliostats (**1001**, **1002**) that track the movement of the sun (col. 11, lines 41-44).

The solar power generating system disclosed by Johnson differs from the instant invention because the instant invention requires the cooling means to be driven by an output, either current or power, of the solar cells. Johnson discloses controlling the cooling means by monitoring the flow of the cooling fluid and by measuring the temperature of the solar cells based upon a control algorithm.

The temperature of the solar cell is proportional to the amount of radiation incident on the solar cell, which governs the amount of energy generated by the solar cell.

Guha et al. disclose a photovoltaic device having a temperature control element **60** attached to the solar cell **10** (col. 17, lines 59-66). The temperature control device **60** is controlled by a controller **64** that controls the device by detecting either the electrical output from the cell **10**, or the illumination incident on the cell (col. 17, line 66 to col. 18, line 5).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the controller of Johnson to use a controller as taught by Guha et al., which detects either the generated output of the cell or the incident radiation, because the controllers are equivalent since the temperature of the cell is proportional to both the radiation incident on the cell and the output generated by the cell.

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Mimura et al. disclose a solar energy conversion device where "the amount of solar radiation is sensed according to the amount of generated electricity or voltage of the photoelectric transducer provided in the heat collector panel" (col. 7, lines 30-38).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the controller of Johnson to sense the amount of electricity or voltage generated by the solar cell, as taught by Mimura et al., because the detection of the electricity generated or the voltage is equivalent to the detection of the temperature of the solar cells, which is proportional to the amount of radiation on the cells and the amount of electricity generated.

Regarding the limitations "wherein said memory-and-operation means comprising...previously determined standard temperature values" in lines 6-7 of claim 1, and "wherein said cooling means is driven in accordance with said standard temperature value" in lines 9-10 of claim 1, the limitations do not positively limit the structure of the claimed device. Standard temperature values are not physical features, but are pieces of information or data stored in a memory device. Furthermore, the limitation "wherein said cooling means is driven in accordance with said standard temperature value" is a method of using the device and does not further limit the structure of the device other than to require the ability to store such values. The device of Johnson uses a microprocessor control system having a control algorithm to manage and control the various systems of the device. In order to perform the control procedures using a control algorithm, the control system must have some form of

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memory to store and execute the procedures that constitute the control algorithm. Combined with the flow monitoring means and surface temperature monitor, such a control system would be capable of performing in the same manner as the claimed use of the instant claims.

### ***Allowable Subject Matter***

7. The following is a statement of reasons for the indication of allowable subject matter:

Claim 8 is distinguished over the prior art of record by providing a method of controlling the cooling of a solar power generation system based upon the electric output of the solar cell. The prior art systems use temperature sensors to control cooling of the system. Johnson (U.S. Pat. No. 6,080,927) teaches a solar cell surface temperature monitor to control the flow rate (see col. 12, lines 44-67). In U.S. Pat. No. 4,148,298, Sherman, Jr., uses a differential temperature sensor to control the flow of fluid through the system based on preset staggered amounts that measure the difference between the energy receiver and cooling medium in a storage space (col. 9, line 46 to col. 10, line 19).

Instead of relying on temperature sensors, the instant invention controls the cooling of the system by detecting the electric energy output of the solar cell and computes the temperature rise associated with such an output and adds that value to the expected temperature of the solar cell based on the time. This value is then used to determine the amount of forcible cooling required. This method differs from the prior art

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because it adjusts the amount of cooling required based on time and estimated temperatures. Since the method also relies on time to control the amount of cooling, the method can operate the power generating system more efficiently by accounting for seasonal temperature differences.

### ***Response to Arguments***

8. Applicant's arguments filed January 14, 2004, have been fully considered but they are not persuasive.
9. Regarding the rejections of claims 1-3 and 5-7, Applicant presents arguments regarding means-plus-function language. In particular, Applicant states, "However, since means plus function language is used to characterize the present invention defined in Claim 1, it is wrong to treat the features of the claim as merely functional" (see page 6 of Applicant's response).
10. Applicant's argument is not persuasive. According to MPEP § 2183, "The limitation in a means-plus-function claim is the overall structure corresponding to the claimed function." Office personnel are to give the claimed means plus function limitations their broadest reasonable interpretation consistent with all corresponding structures or materials described in the specification and their equivalents including the manner in which the claimed functions are performed. See *Kemco Sales, Inc. v. Control Papers Company, Inc.*, 208 F.3d 1352, 54 USPQ2d 1308 (Fed. Cir. 2000).
11. With respect to the guidelines provided by the MPEP, the reference of Johnson teaches all of the structural limitations recited in the instant claims. The instant

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disclosure defines the structure of the operation and memory means as "a mechanism comprising an arithmetic element such as a microcomputer or the like having a memory element such as a nonvolatile memory or/and a cam mechanism, capable of memorizing a given characteristic as a geometry and inputting and outputting a physical positional information" (see page 17, line 19 to page 18, line 10 of the instant disclosure). Therefore the limitation in the means-plus-function claim can be a microprocessor with an electronic or mechanical memory. Since Johnson teaches memory and operation means comprising a microprocessor and memory, the reference anticipates the instant claims by teaching all of the structural limitations recited in the claims.

### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Pat. No. 4,148,298 issued to Sherman, Jr.
13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian L. Mutschler whose telephone number is (571) 272-1341. The examiner can normally be reached on Monday-Friday from 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

blm  
February 6, 2004

  
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